What is claimed is:

1. A method of increasing combustion of a hydrocarbon fuel in a combustion chamber, the combustion normally using only air as an oxidant, part of the air entering the combustion chamber near one or more hydrocarbon fuel burners, and a remaining portion of air entering the combustion chamber at a plurality of locations downstream of said hydrocarbon fuel burners, the method comprising the steps of injecting an oxygen-enriched gas at a velocity through a plurality of lances into a flue gas in the combustion chamber at said plurality of locations downstream of said burners, the oxygen-enriched gas being present in an amount sufficient to provide an oxygen concentration in the flue gas of no more than 2% on a volume basis greater than when said air is used alone as said oxidant.

2. Method in accordance with claim 1 wherein said velocity is subsonic for said oxygen-enriched gas in each of said plurality of lances.

3. Method in accordance with claim 1 wherein some of said oxygen-enriched gas is injected at subsonic velocity in one or more of said plurality of lances while a balance of said oxygen-enriched gas is injected at supersonic velocity through a balance of said plurality of lances.

4. Method in accordance with claim 1 wherein said velocity is supersonic for said oxygen-enriched gas in each of said plurality of lances.

5. Method in accordance with claim 1 wherein some of said oxygen-enriched gas is injected at subsonic velocity in one or more of said lances while a balance of said oxygen-enriched gas is injected at supersonic velocity through one or more of said lances.

6. Method in accordance with claim 1 wherein said lances inject said oxygen-enriched gas at an angle with respect to a wall of the combustion chamber, said angle ranging from about 20° to about 160°, said angle measured in a plane that is perpendicular to the wall.

7. Method in accordance with claim 1 wherein said plurality of locations are arranged so that one-half of said lances are on a first wall of said combustion chamber and one-half of said lances are on a second wall of said combustion chamber, said first and second walls being substantially parallel.

8. Method in accordance with claim 7 wherein said lances on said first wall are separated by a distance L_L, wherein $L_L < L_{CH} / 2$, wherein L_{CH} is selected from the group consisting of height, length, and width of the combustion chamber.

9. Method in accordance with claim 8 wherein said lances on said first wall are positioned a distance l from said lances on said second wall, wherein $0 < l < L_L / 2$, wherein L_L is the distance between lances on said first wall.

10. Method in accordance with claim 1 wherein the combustion chamber is rectangular having four walls.

11. Method in accordance with claim 10 wherein there is at least one lance on each of said four walls of said rectangular combustion chamber.

12. Method in accordance with claim 11 wherein each lance is a distance L' from a wall wherein an adjacent lance is positioned, and $L' < L_{CH,}$ wherein L_{CH} is selected from the group consisting of height, length, and width of the combustion chamber.

13. Method in accordance with claim 11 wherein each lance is positioned at a first angle ranging from about 20° to about 160°, said first angle measured in a first plane which is substantially vertical and substantially perpendicular to its corresponding wall.

14. Method in accordance with claim 13 wherein each lance is positioned at a second angle ranging from about 20° to about 160°, said second angle measured in a plane substantially perpendicular to the first plane.

15. Method in accordance with claim 1 wherein the remaining portion of air enters the combustion chamber through one or more rectangular slots, at least one of said lances positioned in each of said rectangular slots.

16. Method in accordance with claim 1 wherein the remaining portion of air enters the combustion chamber through one or more substantially circular slots, at least one of said lances positioned in each of said substantially circular slots.

17. Method in accordance with claim 1 wherein the oxygen-enriched gas is injected in substitution for said remaining portion of air at at least one of said plurality of downstream locations.

18. Method in accordance with claim 1 wherein said oxygen-enriched gas is injected into said remaining portion of air.

19. A method of increasing combustion of coal in a combustion chamber, the combustion normally using only air as an oxidant, part of the air entering the combustion chamber near one or more coal burners, and a remaining portion of air entering the combustion chamber at a plurality of locations downstream of said coal burners, the method comprising the steps of injecting an oxygen-enriched gas at a velocity through a plurality of lances into a flue gas in the combustion chamber at said plurality of locations downstream of said burners, the oxygen-enriched gas being present in an amount sufficient to provide an oxygen concentration in the flue gas of no more than 2% on a volume basis greater than when said air is used alone as said oxidant.

20. Method in accordance with claim 19 wherein said velocity is subsonic for said oxygen-enriched gas in each of said plurality of lances.

21. Method in accordance with claim 19 wherein said velocity is supersonic for said oxygen-enriched gas in each of said plurality of lances.

22. Method in accordance with claim 19 wherein some of said oxygen-enriched gas is injected at subsonic velocity in one or more of said plurality of lances while a balance of said oxygen-enriched gas is injected at supersonic velocity through a balance of said plurality of lances.

23. Method in accordance with claim 19 wherein the oxygen-enriched gas is injected through said lances at an angle with respect to a wall of the combustion chamber, said angle ranging from about 20° to about 160°, said angle measured in a plane that is perpendicular to the wall.

24. Method in accordance with claim 19 wherein said plurality of locations are arranged so that one-half of said lances are on a first wall of said combustion chamber and one-half of said lances are on a second wall of said combustion chamber, said first and second walls being substantially parallel.

25. Method in accordance with claim 24 wherein lances on said first wall are separated by a distance L_L, wherein $L_L < L_{CH} / 2$, wherein L_{CH} is selected from the group consisting of height, length, and width of the combustion chamber.

26. Method in accordance with claim 24 wherein said lances on said first wall are positioned a distance l from said lances on said second wall, wherein $0 < l < L_L / 2$, wherein L_L is the distance between lances on said first wall.

27. Method in accordance with claim 19 wherein the combustion chamber is rectangular having four walls.

28. Method in accordance with claim 27 wherein there is at least one lance on each of said four walls of said rectangular combustion chamber.

29. Method in accordance with claim 28 wherein each lance is a distance L' from a wall wherein an adjacent lance is positioned, and $L' < L_{CH}$, wherein L_{CH} is selected from the group consisting of height, length, and width of the combustion chamber.

30. Method in accordance with claim 28 wherein each lance is positioned at a first angle ranging from about 20° to about 160°, said first angle measured in a first plane which is substantially vertical and substantially perpendicular to its corresponding wall.

31. Method in accordance with claim 30 wherein each lance is positioned at a second angle ranging from about 20° to about 160°, said second angle measured in a plane substantially perpendicular to the first plane.

32. Method in accordance with claim 19 wherein the remaining portion of air enters the combustion chamber through one or more rectangular slots, at least one of said lances positioned in each of said rectangular slots.

33. Method in accordance with claim 19 wherein the remaining portion of air enters the combustion chamber through one or more substantially circular slots, at least one of said lances positioned in each of said substantially circular slots.

34. Method in accordance with claim 19 wherein the oxygen-enriched gas is injected in substitution for said remaining portion of air at at least one of said plurality of downstream locations.

35. Method in accordance with claim 19 wherein said oxygen-enriched gas is injected into said remaining portion of air.

36. A method of increasing combustion of a first hydrocarbon fuel in a combustion chamber, the combustion normally using only air as an oxidant, part of the air entering the combustion chamber through one or more first hydrocarbon fuel burners in a first

zone of the combustion chamber, and a remaining portion of air normally entering the combustion chamber at a plurality of locations downstream of said first hydrocarbon fuel burners, the method comprising injecting a first oxygen-enriched gas into the combustion chamber at said plurality of locations, the first oxygen-enriched gas being in an amount sufficient to provide an oxygen concentration of no more than 2% greater than when said air is used alone, and wherein the first oxygen-enriched gas is injected through a lance at a velocity, said lance injecting said first oxygen-enriched gas into a flame created by a second oxygen-enriched gas and a second hydrocarbon fuel.

37. Method in accordance with claim 36 wherein said velocity is subsonic.

38. Method in accordance with claim 36 wherein said velocity is supersonic.

39. Method in accordance with claim 36 wherein said second hydrocarbon fuel is selected from the group consisting of gaseous, liquid, and particulate fuels.

40. Method in accordance with claim 36 wherein said second oxygen-enriched gas has substantially the same concentration of oxygen as said first oxygen-enriched gas.

41. Method in accordance with claim 36 wherein each lance is positioned at a first angle ranging from about 20° to about 160°, said first angle measured in a first plane which is substantially vertical and substantially perpendicular to its corresponding wall.

42. Apparatus for combustion of a hydrocarbon fuel in a combustion chamber, the combustion normally using only air as an oxidant, part of the air entering the combustion chamber near one or more hydrocarbon fuel burners, and a remaining portion of air entering the combustion chamber at a plurality of locations downstream of said hydrocarbon fuel burners, the method comprising the steps of injecting an oxygen-enriched gas at a velocity through a plurality of lances into a flue gas in the combustion chamber at said plurality of locations downstream of said burners, the oxygen-enriched gas being present in an amount

sufficient to provide an oxygen concentration in the flue gas of no more than 2% on a volume basis greater than when said air is used alone as said oxidant.

43. Apparatus in accordance with claim 42 wherein said lances allow injection of said oxygen-enriched gas at sub-sonic velocity.

44. Apparatus in accordance with claim 42 wherein said lances allow injection of said oxygen-enriched gas at supersonic velocity.

45. Apparatus in accordance with claim 42 wherein each lance is positioned at a first angle ranging from about 20° to about 160°, said first angle measured in a first plane which is substantially vertical and substantially perpendicular to its corresponding wall.

46. Apparatus for combustion of a hydrocarbon fuel in a combustion chamber, the combustion normally using only air as an oxidant, part of the air entering the combustion chamber through one or more first hydrocarbon fuel burners in a first zone of the combustion chamber, and a remaining portion of air normally entering the combustion chamber at a plurality of locations downstream of said first hydrocarbon fuel burners, the method comprising injecting a first oxygen-enriched gas into the combustion chamber at said plurality of locations, the first oxygen-enriched gas being in an amount sufficient to provide an oxygen concentration of no more than 2% greater than when said air is used alone, and wherein the first oxygen-enriched gas is injected through a lance at a velocity, said lance injecting said first oxygen-enriched gas into a flame created by a second oxygen-enriched gas and a second hydrocarbon fuel.

47. Apparatus in accordance with claim 46 wherein said lance allows injection of said oxygen-enriched gas at sub-sonic velocity.

48. Apparatus in accordance with claim 46 wherein lance allows injection of said oxygen-enriched gas at supersonic velocity.

49. Apparatus in accordance with claim 46 wherein said lance is positioned at a first angle ranging from about 20° to about 160°, said first angle measured in a first plane which is substantially vertical and substantially perpendicular to its corresponding wall.

50. Apparatus in accordance with claim 46 wherein said lance is positioned at a first angle ranging from about 45° to about 135°, said first angle measured in a first plane which is substantially vertical and substantially perpendicular to its corresponding wall.